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## FAVUS: A REPORT OF SEVEN RELATED CASES

BY

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Favus, or tinea favosa, is a ringworm infection of the scalp, skin, and nails rarely seen in Britain, though it commonly occurs in Eastern and Central Europe, in the Mediterranean countries, and in the Near East. The majority of British infections have been sporadic and have occurred in widely scattered areas, but small outbreaks have been reported from urban districts. It has been stated that favus is becoming progressively more rare in this country (Whittle, 1947). Walker (1950) isolated the causative fungus, *Trichophyton schoenleini*, on 42 occasions among 2,473 ringworm cultures. These were grown from specimens received from various parts of Britain. We have been unable to trace any reports of this disease in the London area during the last ten years, and it was not diagnosed mycologically among 760 consecutive patients suffering from ringworm infections seen at the Institute of Dermatology in London (Partridge, 1952). Recently, the diagnosis of favus in a London infant led to the discovery of six unsuspected cases and enabled the source of infection to be traced to another town. This outbreak is reported in order to stress the ease with which the nature of the disease may be overlooked.

In an attempt to trace the source of the infection, attention was directed to a day nursery attended by the affected infant (Case 1). All available contacts were examined under Wood's light, with the result that a second case of scalp infection was discovered (Case 2). Finally, it was learnt that the original child had spent three months in the home of a relative in Kent, where, on inquiry, one adult (Case 3) and four children (Cases 4, 5, 6, and 7) in a single family were found to be suffering from favus. Hairs taken from all six of these patients contained fungous mycelium, and *T. schoenleini* was cultured from five of them.

## Case Reports

**Case 1.**—A female child aged 14 months, living in London, was first brought to hospital in October, 1952. She had suffered from a scurfy condition of the scalp since birth, and on examination was shown to have a number of crusted lesions, but no broken hairs, alopecia, scarring, or scutula. A provisional diagnosis of ringworm was made after microscopy had revealed fungous mycelium in extracted hairs, though cultures were unsuccessful. Whitfield's ointment appeared to control the scalp condition, and after six months only two scaly erythematous patches approximately 1 in. (2.5 cm.) in diameter remained. Under Wood's light, however, a greenish fluorescence was observed along the entire length of many hairs distributed in groups over the whole scalp. These hairs were found to contain fungus, and on this occasion *T. schoenleini* was grown from them. While the condition was being re-investigated local treatment was discontinued, and this resulted in the appearance of typical scutula on the scalp (Fig. 1); there was also spread of the infection to one knee.

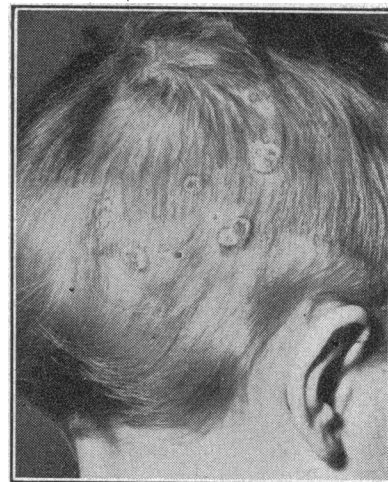


FIG. 1.—Case 1. Typical scutula on scalp.

**Case 2.**—This 1-year-old boy had a single small scaly patch  $\frac{1}{2}$  in. (1.3 cm.) in diameter on the occipital region of his scalp. The lesion, which had been present for six months, was first observed two months after he had been attending the day nursery, where he was a close companion of Case 1. Though hairs growing from the affected area appeared normal, they fluoresced a dull green colour under Wood's light.

**Case 3.**—A woman aged 33, the aunt of Case 1, had suffered from scalp trouble since the age of 5, resulting in bald patches since she was 18. Various therapeutic measures had been tried without success. She had lived in Yorkshire, but had never resided outside Britain and was unable to explain the source of her infection. Examination showed a large scarred bald area—5 by 4 in. (12.5 by 10 cm.)—over the left parietal region with erythema, scaling, and

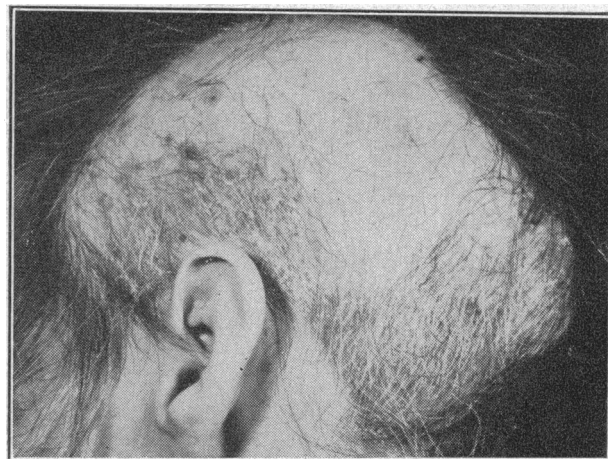


FIG. 2.—Case 3. Large scarred bald area, with erythema, scaling, and scutula at its periphery.

scutula at its periphery (Fig. 2). The hairs in this zone were grey and lustreless, and under Wood's light fluoresced along their entire length. A definite "mousy" odour was detectable.

**Case 4.**—A girl aged 12, the eldest daughter of Case 3, had had crusting of the scalp since she was 6. She presented with several areas of atrophy and alopecia showing peripheral erythema and scaling, and long fluorescent hairs were again seen.

**Case 5.**—A second daughter of Case 3, aged 8, had suffered from a scaly scalp since shortly after birth. She had received hospital treatment for this during the previous year, but favus had not been suspected. On examination a widespread scaly condition of the scalp and several small scutula were found; long fluorescent hairs were demonstrable with Wood's light.

**Case 6.**—A third daughter of Case 3, aged 6, was found to have several scaly patches associated with scutula over the vertex of her scalp; within these areas long fluorescent hairs were found.

**Case 7.**—The twin sister of Case 6 presented no clinical evidence of favus. Careful examination of her scalp under Wood's light revealed two fluorescent hair stumps in the occipital region which showed the characteristic appearances of *T. schoenleini* infection when examined microscopically. The fungus was not grown.

All these patients, except the last, were treated by hair removal with x rays. Complete epilation was achieved except in Case 3, in which a few remaining infected hairs required removal with a diathermy needle. No infected hairs reappeared except in Case 5, in which some infected hair stumps developed; these were treated by follicular cauterization. Case 7 was successfully treated by manual epilation of the hairs involved.

### Discussion

The familiar characteristics of a typical case of favus of the scalp represent late manifestations of the disease. Scutula, alopecia, and atrophy were present in Cases 3 and 4, in which the disease had persisted for 28 and 6 years respectively, but no alopecia or atrophy occurred in Cases 1, 2, 5, and 6. Broken hairs are rarely found in this disease, though they were the one diagnostic feature in Case 7. Initially the hairs are usually macroscopically normal, but later lack lustre; under Wood's light a dull, greenish fluorescence may be seen along their entire length—an invaluable method of detecting early infection. This feature is useful, too, in distinguishing favus from *Microsporum* infections, in which bright yellow-green fluorescent hair stumps occur, and from other *Trichophyton* infections where fluorescence is lacking. The mild symptoms and signs of this disease and its insidious progress lead to delay in seeking medical advice. The appearances may be unlike typical ringworm and may resemble those of psoriasis, impetigo, seborrheic dermatitis, folliculitis decalvans, and sometimes lupus erythematosus and lupus vulgaris. Consequently, failure to prescribe adequate treatment is not uncommon, and local applications prescribed haphazardly may further confuse the clinical picture.

In all doubtful cases, unequivocal evidence of favus can be obtained only by microscopy and culture. Microscopical examination of hairs in potash reveals mycelium and chains of spores within the shafts, and characteristic elongated air-spaces are seen at the sites of degenerated mycelium. Colonies of *T. schoenleini* grown at 26° C. on Sabouraud's agar are deep cream in colour, compact and glabrous, and have an irregularly corrugated surface. Their rate of growth is very slow, taking about three weeks to reach a size sufficient for macroscopic identification. Microscopical examination of the partially submerged growth may reveal characteristic antler-like hyphae after ten days.

Favus is essentially a human infection caused by *T. schoenleini*, and should not be confused with mouse favus,

caused by *T. quinckeanum*. When the latter infection occurs in man it produces acute, vesicular, and circinate lesions within a few days. In man, hair infections are rare, and the scutula seen in murine infections do not occur.

Unlike most other varieties of ringworm of the scalp, untreated favus may, as in Case 3, persist beyond puberty into adult life; spontaneous retrogression occurs only occasionally. Treatment is effective if administered before atrophy and permanent alopecia supervene; epilation with x rays is accepted as the most satisfactory method of treatment. Examination with Wood's light is necessary in order to detect infected hairs which have not fallen, and to exclude reinfection of new hairs. Local applications are sometimes successful in early cases, but necessitate close supervision.

The group of infections in the family living in Kent appeared to be the source of disease in the first case. The fact that so few children were involved in the day nursery is explained by the low infectivity of the fungus. As in the outbreak described, it is a disease of the family rather than of the school. Every effort should be made to trace the source of infection, since the disease may otherwise go unnoticed and cause disfigurement.

### Summary

Seven cases of favus of different degrees of severity are reported from the London and Kent areas. Their diagnosis and the identification of the source of infection are described.

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## A TABLET TEST FOR BLOOD IN URINE

BY

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Many chemical tests for blood in urine have been described (Caplan and Discombe, 1951), but because they are insensitive or inconvenient none is in general use. The most sensitive are modifications of the *o*-toluidine method, first described by Ruttan and Hardisty (1912); a blue colour results from the oxidation of *o*-toluidine owing to the peroxidase activity of haemoglobin. The modifications previously described include those of Zwarenstein (1949, 1952) and Baron (1951), but all require the use of glacial acetic acid and are therefore unsuitable for use at the bedside. In the test here described the reagents are compounded into a tablet, and it is only necessary to add water.

### Experimental

Tablets were made, each containing citric acid, 50 mg.; barium peroxide, 35 mg.; *o*-toluidine, 12.5 mg.; and sodium carbonate, 2.5 mg. If the tablets are kept in a container with a screw cap, and the cap is replaced immediately one is removed, they have been found to retain their full sensitivity for at least twelve months.

**Tablet Test.**—Various quantities of urine were tried (see Table I), and the following method was selected as giving the best results. One drop of the urine to be tested (0.05 ml. from a teated pipette) is placed on an inch square (2.5 by 2.5 cm.) of filter paper (Whatman No. 1) and allowed to